

## ASH AND SLAG HANDLING

### 3.2. Ash and slag handling systems at TPPs

#### 3.2.5. Ash and slag disposal sites

Ash and slag disposal sites are intended for long storage (disposing) of a part of ash and slag unclaimed by consumers. Ashes and slags are disposed in the form of slurries at constructed surface ash and slag lagoons or dry ash and slag landfills. Mines and open cast mines can be also used as ash disposal sites. Here only surface ash and slag disposal sites are considered. Ash and slag lagoons are complicated hydraulic engineering constructions.

##### 3.2.5.1. Ash and slag lagoons

*Putilov V.Y., MPEI(TU); Vishnya B.L., UralORGRES*

Ash and slag lagoons (inwash ash disposal sites) are characterized by high breakdown rates as in Russia (according to investigations conducted by the firm "ORGRES" in 1970-1980-ties up to 70 % of ash and slag lagoons were in the emergency condition), and in other countries. For the last 25 years there were failures and emergency conditions were observed at ash lagoons of Abakanskaya, Barabinskaya, Intinskaya, Ust-Ylymskaya, Vologodskaya, Aleksinskaya, Blagoveshchenskaya and Kyzylskaya CHPPs; Severodvinskaya, Khabarovskaya, Krasnoyarskaya and Orskaya CHPPs-1; Leningradskaya and Vladivostokskaya TPPs-2, Vorkutinskaya CHPPs; Irkutskaya CHPP-1 and CHPP-10; Kirovskaya CHPP-3 and CHPP-4; Yaroslavlskaya CHPP-1 and CHPP-2; Sakhalinskaya, Neryungrinskaya, Shchekinskaya, Partizanskaya, Ryazanskaya, Belovskaya, Yuzhno-Kuzbasskaya and Chulmanskaya SDPPs; Zuevskaya SDPP-2, resulted in huge financial losses and environmental contamination. Thus, from 70 to 80 % of the total estimated and greatest possible

damage being a result of ash lagoons failures fall on ecological component.

The reasons of unsatisfactory conditions of ash and slag lagoons are errors and deviations from norms and rules of their designing, building and operating (23, 28 and 49 % of failures accordingly). Quality operation and maintenance of ash lagoons in technically sound state is complicated because at many TPPs there are no experts in hydrotechnics and specialized divisions on operation, repair and building-up the ash lagoons.

Expenses for construction of hydraulic ash removal systems and lagoons reach 12 ... 17 % of the cost of TPP, and expenses for their operation make 7 ... 10 % of general operational expenses of TPP. Thus, cost of ash lagoon construction makes 60 ... 70 % of a total cost of hydraulic ash and slag removal system.

The basic disadvantages of ash lagoons are:

- low capacity owing to low density of the washed ashes and slags and difficulty in their uniform dumping;
- high breakdown rate of inwash ash lagoons;
- necessity of increase in ash disposal area because of 2 reasons:
  1. besides the useful area, where the washed ashes and slags are directly dumped, the area for building of a clearing pool to purify water, used at wet ash and slag conveying, is required;
  2. small steepness of slopes of protecting dams;
    - need in tiered erections of escalating dams at operating ash disposal sites.